

IN THE CLAIMS

Please cancel claims 1-19 and 21-22, and amend the claims as follows:

20. (previously presented) A method of manufacturing an optical identification element; the method comprising:

    providing a substrate;

    winding the substrate around a device to provide at least one grating writing section;

    writing at least one grating into the substrate disposed in the grating writing section;

    bonding the substrate in the at least one grating writing section to a sheet material; and

    splitting the substrate disposed in the grating writing section to form a plurality of optical identification elements by cutting the substrate bonded to the sheet material without cutting through the sheet material.

21. (Canceled)

22. (Canceled)

23. (new) A method of manufacturing optical identification elements, the method comprising:

    forming a diffraction grating in a fiber substrate along a longitudinal axis of said substrate, said grating having a resultant refractive index variation; and

    cutting the substrate transversely to form a plurality of optical identification elements, said elements having said grating therein along substantially the entire length of said elements and each of said elements have substantially the same resultant refractive index variation.

24. (new) The method of claim 23, wherein the number of said plurality of elements comprises at least: 10, 100, 1,000, 10,000, 100,000, or 1,000,000.

25. (new) The method of claim 23, wherein said grating provides an output optical signal indicative of a code when exposed to incident light and wherein each of said plurality of elements have substantially the same code.

26. (new) The method of claim 23, wherein the step of cutting is performed by a blade, a laser, or a mechanical anvil.

27. (new) The method of claim 23, wherein the step of forming is performed by creating an optical interference pattern at said grating location.

28. (new) The method of claim 27, wherein said interference pattern is formed by interfering at least two laser beams.

29. (new) The method of claim 27, wherein said interference pattern is formed by a phase mask having a laser beam incident thereon.

30. (new) The method of claim 23, further comprising:  
forming said fiber substrate into a fiber ribbon;  
tensioning a layer of said fiber ribbon between a plurality of adjacent supports on a holding device so as to form a plurality of substantially flat grating writing sections;  
forming said grating with a single exposure in the plurality of the substantially flat grating writing sections; and  
removing the layer of fiber ribbon from the adjacent supports.

31. (new) The method according to claim 30, wherein the method further comprises adhering a strip of tape to an outer surface of the layer of fiber ribbon so as to form a taped layer of fiber ribbon.

32. (new) The method according to claim 30, wherein the method further comprises attaching the taped layer of fiber ribbon onto a fixture

33. (new) The method according to claim 30, wherein the step of cutting includes cutting the fiber ribbon so as to form the plurality of optical identification elements.

34. (new) The method according to claim 30, wherein said ribbon forming step comprises winding at least two or more wraps of the fiber substrate around the device to form said ribbon.

35. (new) The method of claim 23, wherein the substrate is photosensitive.

36. (new) The method of claim 23, wherein the refractive index variation comprises at least one refractive index pitch superimposed at said grating location.

37. (new) The method of claim 23, wherein the refractive index variation comprises a plurality of refractive index pitches superimposed at said grating location.

38. (new) The method of claim 23 wherein said fiber is not a waveguide.

39. (new) An optical identification element, made by the process of:  
forming a diffraction grating in a fiber substrate along a longitudinal axis of said substrate, said grating having a resultant refractive index variation; and  
cutting the substrate transversely to form a plurality of optical identification elements, said elements having said grating therein along substantially the entire length of said elements and each of said elements have substantially the same resultant refractive index variation.

40. (new) A method of manufacturing optical identification elements; the method comprising:

providing a fiber substrate having a diffraction grating disposed therein at a grating location along a longitudinal axis of said substrate, said grating having a resultant refractive index variation; and

cutting the substrate transversely at said grating location to form a plurality of optical identification elements, said elements having said grating therein along substantially the entire length of said elements and each of said elements have substantially the same resultant refractive index variation.

41. (new) The method of claim 40, wherein the number of said plurality of elements comprises at least: 10, 100, 1,000, 10,000, 100,000, or 1,000,000.